



Spectroscopic divertor measurements of N II, Ne II, and Ar II are used to challenge theoretical scaling laws of impurity concentration thresholds for detachment

Experimental scaling laws

- Least squares regression of spectroscopic c_N measurements from JET-ILW and AUG

$$c_N = 5.89 \pm 2.73 P_{div,outer}^{1.16 \pm 0.23} n_{e,sep}^{-2.72 \pm 0.22} I_P^{1.05 \pm 0.6} a_{min}^{-2.36 \pm 0.88}$$

Theoretical scaling laws

- Generally consistent with experimental parameter dependencies with a moderate discrepancy on $n_{e,sep}$ but differ significantly on absolute concentrations

